NON-PUBLIC?: N
ACCESSION #: 9304010184
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Peach Bottom Atomic Power Station - PAGE: 1 OF 04
Unit 2

DOCKET NUMBER: 05000277

TITLE: Automatic Scram on Reactor Water Level when a Condensate Pump Trip Caused Two Reactor Feed Pumps to Trip on Low Suction Pressure
EVENT DATE: 03/02/93 LER #: 93-004-00 REPORT DATE: 03/26/93

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 070

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv) & 50.73(a)(2)(v)

LICENSEE CONTACT FOR THIS LER:
NAME: Anthony J. Wasong, Regulatory Supervisor TELEPHONE: (717) 456-7014

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: BJ COMPONENT: RLY MANUFACTURER: C770
REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On 03/02/93, the "C" Condensate Pump breaker tripped open and caused the "A" and "C" RFPs to trip on low pump suction pressure. The Reactor water level decreased to the scram setpoint. The High Pressure Coolant Injection (HPCI) and the Reactor Core isolation Coolant (RCIC) systems started on low Reactor water level. The HPCI and RCIC systems continued to restore Reactor water level until the "C" RFP was returned to service. An Unusual Event was declared due to the HPCI injection to the reactor from a valid initiation signal. The Unusual Event was terminated at 1908 hours. The cause of the scram has been determined to be an unexpected trip of the "C" Condensate Pump. An investigation was conducted to inspect the relays and components which could have caused the "C" Condensate Pump trip and no equipment problems could be reproduced.

Therefore, it has been concluded that the trip was not due to equipment failure. An investigation did identify a human factors issue with the location of the control switches. After HPCI had completed its function, it was discovered that the HPCI Auxiliary Oil Pump (AOP) would not start. The cause of the HPCI AOP failure has been determined to be a spurious failure of a time delay relay to properly operate. The relay coil has been replaced and setup. An evaluation will be performed on this event and previous similar type relay problems to identify additional corrective actions.

END OF ABSTRACT

Requirements of the Report

This report is being submitted pursuant to 10 CFR 50.73 (a)(2)(iv) due to Engineered Safety Feature (ESF) actuations and to satisfy the requirements of 10 CFR 50.73 (a)(2)(v) describing conditions that alone could have prevented the fulfillment of a safety function.

Unit Conditions at Time of Event

Unit 2 was in the "RUN" mode at 70% of rated thermal reactor power with the "B" and "C" Condensate Pumps (EIIS:SD) (EIIS:P) and the "A" & "C" Reactor Feed Pumps (RFP) (EIIS:SK) in-service. The "B" RFP was out of service at this time. There were no other systems, structures, or components that were inoperable that contributed to the event.

Description of the Event

On 03/02/93 at 1830 hours, when attempting to place the "A" Condensate Pump in-service, the "C" Condensate Pump breaker tripped open. Having only the "B" Condensate Pump in-service while at 70% power caused the "A" RFP to trip on low pump suction pressure. The loss of the "A" RFP caused the Reactor water level to decrease to the low level scram setpoint resulting in an automatic scram. In addition, Primary Containment Isolation System (PCIS) (EIIS:JM) Group II/III isolations also occurred when the Reactor water level decreased below 0". The High Pressure Coolant Injection (HPCI) (EIIS:BJ) system, Reactor Core isolation Coolant (RCIC) (EIIS:BN) system, and the Alternate Rod insertion system also initiated when Reactor water level dropped below the -48" set point. The -48" initiation caused the start of HPCI and RCIC systems and a trip of the Recirculation Pumps (EIIS:AD). While the HPCI and RCIC systems were in the injection mode, the "C" RFP also tripped on low pump suction pressure. The HPCI and RCIC systems continued to restore Reactor water level until the "C" RFP was

returned to service. Subsequently, the HPCI system was placed in the standby mode. The RCIC system was left in the injection mode to assist in the control of Reactor water level. At 1840 hours, an Unusual Event was declared in accordance with the Emergency Plan due to the HPCI and RCIC injection to the reactor from a valid initiation signal. The NRC was notified of the event via ENS at 1855 hours and the Unusual Event was terminated at 1908 hours. The PCIS and the Reactor Protection System (RPS) (EIIS:JC) scram logics were reset and the affected systems were restored to the appropriate configuration. After HPCI had completed its function, it was discovered that the HPCI Auxiliary Oil Pump (AOP) would not start on 03/03/93 at approximately 0830 hours.

Cause of the Event

The cause of the scram has been determined to be an unexpected trip of the "C" Condensate Pump. Having only the "B" Condensate Pump in-service while at 70% power caused the "A" and "C" RFPs to trip on a low pump suction pressure. The "A" RFP tripped immediately and the "C" RFP tripped on a time delay soon after. The loss of the "A" RFP caused the Reactor water level to decrease to the low level scram setpoint. An investigation was conducted to determine the cause of the condensate pump trip. The relays and components which could have caused the "C" Condensate Pump trip were inspected and no equipment problems were found or could be reproduced.

Another possible cause of the pump trip involving human performance was also investigated. Operations personnel were in the process of placing the "A" Condensate Pump in-service in accordance with SO-5.1.B-2 "Placing a Second and Third Condensate Pump In Service" when the trip occurred. it was postulated that the Reactor Operator trainee (Utility:Licensed) could have inadvertently actuated the "C" Condensate Pump Suction Valve instead of the "A" Condensate Pump Suction Valve since these valve control switches are located adjacent to one another. The "C" Condensate Pump Suction Valve is interlocked with the "C" Condensate Pump Motor Breaker to trip the motor breaker open ff the suction valve is not in the full open position.
Several reenactments were made at the plant and on the simulator to determine ff human performance was the cause of the condensate pump trip. Information obtained from these reenactments and extensive interviews did not substantiate that human performance was the cause of the "C" Condensate Pump trip. However, the investigation did identify a human factors issue with the location of the control switches.

The cause of the HPCI AOP failure has been determined to be an unexpected spurious failure of a time delay relay (TA) (EIIS:RLY) to properly operate in the control logic. The relay is located in the HPCI Room and these type

relays are Cutler Hammer model 673. Extensive troubleshooting was performed on the HPCI AOP control logic and it was determined that the TA relay was not sequencing the starting resistors at the correct time.

Analysis of Event

No actual safety consequences occurred as a result of this event.

All isolations and initiations functioned per design. If a design basis accident or transient would have occurred and the HPCI system failed to start, the Automatic Depressurization System (EIIS:RV) was operable, if required, to reduce Reactor (EIIS:RPV) pressure to allow the low pressure coolant injection (EIIS:BO) systems to inject. The RCIC system was also operable to provide core cooling.

Corrective Actions

After the scram occurred, the appropriate PCIS and RPS scram logics were reset and the affected systems were restored to the appropriate configuration.

The scram has been discussed with the involved individuals. The pertinent information tom the scram will be provided to the appropriate Operations Personnel.

The control panel will be evaluated to identify any human factor issues. Corrective actions will be implemented as appropriate.

The HPCI TA relay coil has been replaced and setup per the manufacture's recommendations. An evaluation will be performed on this event and previous similar TA relay problem events to identify what additional corrective actions are required to assure continued proper operation of the HPCI and other systems which utilize these type relays.

Previous Similar Events

No previous similar events has been identified which involved a the loss of the RFPs when a condensate pump was started.

Four previous similar events have been identified which involved problems with this and similar type relays. The failure mode for each of these events was different. Therefore, it is not expected that the previous corrective actions would have prevented this event. However, since several problems have occurred which involve the TA relays, an evaluation will be

performed on this event and previous similar TA relay problem events to identify what additional corrective actions are required to assure continued proper operation of the HPCI and other systems which utilize these type relays. Therefore, the corrective action addressed above will minimize future occurrences.

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CCN 93-14037

PHILADELPHIA ELECTRIC COMPANY

PEACH BOTTOM ATOMIC POWER STATION

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KEN POWERS
PLANT MANAGER March 26, 1993

Docket No. 50-277

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: Licensee Event Report
Peach Bottom Atomic Power Station - Unit 2

This LER concerns an automatic scram on Reactor water level when a condensate pump trip caused two Reactor Feed Pumps to trip on low suction pressure.

Reference: Docket No. 50-277
Report Number: 2-93-004
Revision Number: 00
Event Date: 03/02/93
Report Date: 03/26/93
Facility: Peach Bottom Atomic Power Station
RD1, Box 208, Delta, PA 17314

This LER is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(iv) and 10 CFR 50.73(a)(2)(v).

Sincerely,

cc: J. J. Lyash, US NRC Senior Resident Inspector
T. T. Martin, US NRC, Region I

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